# **HABITAT CONDITIONS**

## **CHANNEL ALTERATIONS**

Extensive channelization has taken place in the Nodaway River basin. Large scale channelization was begun around 1900 by local drainage districts, and most of the channel modifications were completed by the 1930's (USCOE 1973, USDA 1981). The main purpose of channelization in the Nodaway River basin was to alleviate the problems of flooding and to increase the amount of tillable land. Data from a Missouri Department of Natural Resources study indicates that 94 of the original 105 miles of the Nodaway mainstem within Missouri have been channelized. Only the lower 11 miles of river remain unchannelized (MDNR 1986a). Only two streams fourth order or higher in the Nodaway basin have not experienced noticeable channelization (East Fork Number 1 and Highly Creek). About 78% of the original Nodaway River basin stream mileage has been altered by channelization (Table 13). Only 36% of the remaining mileage in fourth, fifth, and sixth order streams is not channelized. Since channelized systems rarely if ever recover (Binns 1978), the Nodaway River basin may never recover as a naturally meandering river system.

Channelization reduces channel length and increases stream gradient which in turn increases the streams ability to erode its bed and banks. This serves to isolate the stream from its original flood plain, and over time, creates a new flood plain. In the upper areas of the basin, significant gully erosion is occurring due to past channelization, causing instability in the smaller branching tributaries (USDA 1981). Channelization is responsible for increasing sediment bed load and reducing aquatic pool and riffle habitat, which in turn negatively alters the variety and quantity of aquatic life (USDA-SCS 1982).

Table 13. Miles of channelization for streams fourth order and larger in the Nodaway River basin.

Order	Streams (number)	Streams Unaltered	Original Miles	Miles Unchannelized (% of orig.)	Miles Altered (% of orig.)	Current Miles	Miles Channelized (% of current)
6	21	0	226	50 (22)	176 (78)	138	88 (64)
5	5	0	284	81 (28)	203 (72)	191	110 (58)
4	23	2	351	188 (54)	163 (46)	283	95 (34)
4,5,6	30	2	861	319 (38)	542 (62)	612	293 (48)

<sup>&</sup>lt;sup>1</sup> - The Nodaway River splits into three branches in its' upper reaches, the West Nodaway River, Middle Nodaway River, and East Nodaway River. The West Nodaway is a sixth order river and the East Nodaway a fifth order river where they join and form the Nodaway River. The West Nodaway and Nodaway River mileages are combined for this table.

#### **UNIQUE HABITATS**

Very little habitat in the Nodaway basin in Missouri or Iowa is seen as unique due to extensive disturbances to the watershed. In Missouri, only Long Prairie was classified as significant by Kramer (1993), but 11 sites were considered notable. Most of these areas were very small and exhibited signs of disturbance. The Nodaway River has two "Shut-ins" in Missouri, one just south of Maitland and the other just east of New Point (Beveridge 1978). In Page County, Iowa there is one remnant stand (less than two acres) of tallgrass prairie adjacent to the Hawleyville cemetery that is considered a unique natural element (Varland 1984). Woodside Prairie, a small privately owned prairie in Adair County is home to two endangered plant species, Meads milkweed and western prairie fringed orchid (Kevin Blazek, Adair County Conservation Board, personal communication). A high quality native prairie is also found in southeast Cass County, Iowa (T74N, R34W, sec. 13; Melanie Perry, Cass County Naturalist, personal communication).

## IMPROVEMENT PROJECTS

A tree revetment was installed at Possum Walk Access near Elmo by the Missouri Department of Conservation in 1992. It was buried by silt after a high water event and no other projects have been attempted. Vince Travnichek (MDC) indicated that no long term bank stabilization occurred as a result of the project and it was not considered a success.

### STREAM HABITAT ASSESSMENT

In Iowa there are remnant reaches of streams with good instream habitat (stable substrates, pool-run-riffle complexes, woody cover, and nominal riparian corridors) and diverse aquatic communities present (IADNR, 1997b). However, John Olson (IADNR) indicated that they were not typical of the Nodaway River basin as a whole in Iowa. Florida Creek, Nichols Creek, and Smith Creek had better habitat (less turbid water, deeper water, rocky stable bottoms, more pool-run-riffle complexity, and better riparian corridors) than other streams sampled in the Missouri section of the basin. Forested riparian corridors are generally narrow to non-existent along basin streams. Most streams are surrounded by cultivated row crops, or pasture. In areas that are intensively row cropped, levees are commonly encountered. Stream banks throughout the basin are usually high, steep, and show visible evidence of erosion (exposed soil, lack of vegetation, and bank sloughing). According to Schumm's channel evolution model most streams in the Nodaway River basin in Missouri are stage three with near vertical banks and a flat channel bottom or stage four with aggrading of sediment and bar formation occurring (Schumm et al. 1984).